SBC Project No. 529/000-08-2012-19
Task Authorization # 19-029-N
Funding Source: Agency Capital Funds Capital Maintenance
Moss Building Water Infiltration
Ellington Agricultural Center
Nashville, Davidson County, Tennessee

Programming Verification Report
August 26, 2018
SSR # 18440600

General

The purpose of this report is to outline a Program for the above mentioned project. The information in this report is based on our Task Authorization, Programming Pre-Design Conference (PDC), and field observations. Field work was performed on August 1 & 2, 2018 and included visual documentation of existing conditions, water infiltration testing, and investigative test cuts with the assistance of a contractor. A Pre-Design Conference was held on site on August 14, 2018 and is summarized in meeting minutes dated the same day. The field work was performed prior to the conference in order to communicate to the team the magnitude of the in progress scope and budget recommendation. This report summarizes our site documentation, interviews of facility managers, objectives of the Program, and provides advisement specifically on scope, budget, and schedule. Photographic documentation is attached to the end of this report.

Executive Summary

Details of the recommendations are provided in the corresponding advisement/ recommendations section. To summarize, SSR recommends a full roof replacement of all roof areas on the building, roof scupper modifications, structural repair of damaged trusses, and tuck-pointing of the vertical brick masonry. Water leakage was re-created during testing at transitions between systems and entrapped water documented within the roof. The roof consists of multiple systems of varying ages, deterioration, and installation quality. The goal of the recommended scope is to provide one, continuous roof installation to eliminate all roof related water intrusion and repair adjacent deteriorated vertical wall systems.

1. SITE VISIT/ EVALUATION

a. Site Conditions

1) The Moss Building is located at the Ellington Agricultural Center in Nashville, Tennessee. The 2 story building was reportedly constructed in 1927 and has been renovated over the years to house the offices for the State of Tennessee's Department of Agriculture Commissioner, Budget, Human Resources, and Public Affairs representatives. The structural frame of the building consists of conventional "stick-built" post and beam wooden members. The roof system includes wood plank decking, 2"x6" timber roof trusses, covered with metal panels and small portions of EPDM membrane. The vertical walls include post and beam construction of multi-wythe brick masonry. The interior finishes consist of plaster and lathe at ceilings and walls. There are pre-cast concrete lintels and sills at the windows. There are four square brick chimney structures located at the north and south sides of the building near the high ridge point of the standing seam metal roof. The chimneys extend above the upper roof level and each are covered with decorative copper caps. There are second story covered porches on the front western side and back eastern side of the building with six large columns on each side with decorative architectural capital and leave pattern volutes above the neck of the column. *See photos 1-14 and 250-251.*
2) The roof of the building includes five (5) distinct roof sections. The upper roof section is covered with a standing seam metal roof system that was installed in 2005. The standing seam metal roof system may have been

installed directly over an existing flat-lock, soldered seam metal panel roof system. A portion of the upper roof section, (848 sf), has not been covered by the new standing seam system and the original flat metal panels are exposed. The exposed flat metal panels extended up and over the inside of the parapet walls. The flat soldered seam metal roof panels have been covered with a red colored acrylic coating to match the color of the standing seam panels. The coating was presumably applied when the metal roof was installed. *See photos 35-61.*

3) Core test were performed in order to determine the exact construction of the upper roof section. A sample was taken through the existing original flat metal panel. The test revealed that the metal panel had been installed over a layer of red rosin paper, and over an asphaltic ice & water shield, directly over the wood plank decking. The core sample also revealed that the red rosin paper was wet and there was a small amount of water between the bottom of the metal panel and the top of the rosin paper. There was some evidence of deterioration on the wood plank decking, but most of the deck was in good condition. The conditions indicated that the asphalt underlayment has been protecting the wood decking and forcing the water to the low-slope area near the base of the wall by the parapets and the scupper drain boxes. *See photos 198-206*.
4) The building has two semicircle shaped building sections extending out from the main building, located at the center of the north and south elevations. These sections consist of brick walls with bay windows and are covered with an older flat soldered seamed metal turret roof system and the age of this system is unknown. Each of these sections has a semicircle gutter along the roof edge and have a downspout that leads down to the lower roof sections. *See Photos 237-240.*
5) The building has two lower roof sections located on the north and south elevations of the building. These roof systems are mirror images of each other and are approximately 1,189 sf in size. The majority of these roof sections are covered with the same standing seam metal roof system as the upper roof section. Like the upper roof, and as part of the roof construction, the lower portion of the existing flat soldered seam metal panels were left in place. However in 2014, in an attempt to solve water infiltration issues, an EPDM membrane was installed above the original metal panels and up onto the parapet walls. It appears that several attempts have been made to control the water entry. In some locations, the top and bottom seam connections for the metal panels have been covered with a white elastomeric coating. In other areas, patches of uncured black colored EPDM cover strip were applied over the top seam joints and lower panel connections of the metal roof system. These repairs did not seem to correct the water infiltration issues in these areas and were not successful at maintaining or matching the aesthetic of the other metal roof systems or the requirements by the Tennessee Historical Commission (THC) to be followed on this historic site. *See photos 62-97.*
6) Core test were performed on each of the lower roof sections, through the existing original metal panel. These test cuts revealed a similar condition as the upper roof section where the metal panel is installed over a layer of red rosin paper and a lower asphaltic ice & water shield that was installed directly over the wood plank decking. These core samples also revealed that the red rosin paper was wet and there is water between the bottom of the metal panel and the top of the asphalt membrane. There was no evidence of deterioration on the wood plank decking. It appears that the asphalt membrane is protecting the decking and forcing the water to the low-slope area of the panels by the edge of the parapet wall. *See photos 188-197.*
7) Around the perimeter of the majority of the building, stone coping caps have been placed above the tops of the masonry walls and act as a cap to the parapet walls. On the parapet walls of the upper roof sections the tops of the parapet walls are covered with a thin, metal panel, with the exception of the center portion of the parapet walls which are covered with stone coping caps.
8) Test cuts were taken along the edge of the stone coping cap. The purpose of these cuts were to determine the construction of the base flashings in relation to the stone cap. These tests cuts revealed that the metal panel installed along the edge as a base flashing, does not extend under the stone coping cap but stops immediately under the edge of the cap. The top of the parapet wall has little or no protection against water infiltration from underneath the cap. Although the edge of the metal is slightly bent upward towards the bottom of the stone

cap, there is more than enough room for water to enter above the metal and down into the wall space. *See photos 207-214.*

9) Directly adjacent to the Northeast corner of the lower roof section, there is a canopy connector archway leading to a stand-alone building. Both the canopy roof and stand-alone building's roof consist of older sloped flat-lock soldered seam metal roof panels with external gutters and downspouts. Adjacent to the stand-alone building to the northeast, is a covered walkway leading to another building. Both the covered walkway and building to the north of the Moss Building have newer metal standing seam roofs that were recently installed. *See photos 231-236.*

b. <u>Condition Assessment</u>

1) Review of Current Roof Drainage
   a) The west side of the upper roof system drains through two (2), six inch, round scuppers at the base of the parapet wall into piping across the lower roof sections, through the lower parapet wall into a collector head, and downward through 3" x 4" downspouts, to underground receptacles. Existing drain screens appear to stop a major portion of the leaves and debris from going into the pipe, however the debris hinders effective drainage of the roof area. These screens are currently only attached at the top corners of the screen and as a result debris can enter into the scupper and further hinder drainage through the piping and the leader. Each of these 6 inch round scuppers are responsible to drain 1,073 sf of roof surface area. Drainage calculations have determined that the scuppers are too small to handle the drainage of this area. Additionally, there are no overflow drainage scuppers to address overflow drainage requirements. On the east side of the upper standing seam metal roof, water is diverted into gutters along the north and south ends of the roof and then through downspouts and piping directly to the lower roof scupper drains. *See photos 98-101.*
   b) Although the leaders from the upper to lower sections are large enough to handle the isolated flow of each scupper, the stark white appearance of the piping does not match the overall aesthetic of the other roof components which does not meet the goals of the Tennessee Historical Commission of maintaining an appearance typical of the original construction. *See photos 72 and 94.*
   c) Portions of the gutters for the semicircle bay roofs are clogged with debris and do not have the appropriate slope to force water to the downspouts which are located at the far edge of the roofs.
   d) The lower roofs on the north and south side of the building drain by means of round scupper drains which are located through the horizontal field of the roof system on the South side, and on the vertical elevation of the roof on the North side. These scuppers are connected to custom made, scupper boxes located in the wall that extends out of the masonry wall into round piping, down into custom made, decorative metal collector heads, and then down into 3" x 4" downspouts, into a below grade receptacle. Light gage pieces of screen have been installed over the opening for the scuppers in an attempt to stop debris from entering into the piping. These scuppers do not appear to work effectively and because of their size as well as their vertical design these scuppers do not meet the requirements to the drainage code. In addition no overflow drainage scuppers have been constructed to address overflow drainage requirements. *See photos 102-118.*

2) Review of Interior Conditions
   a) The interior finishes of the building include plaster and lathe. The office areas, conference room and the commissioner's office have detailed ornate patterns that serve as a custom formed plaster crown molding. This detail reportedly matches the original construction of the home in the early 1900's and serves to preserve the historical character of the building. There is water damage to the interior finishes at all four corners of the building. *See photos 15-16, 24-29, 252-262.*

3) Review of Leaking Conditions:
   a) Reportedly for more than six years there have been four major roof leaks which have affected the interior finishes of the building. Each of these leaks are located nearby a roof scupper, in each of the four corners of the building. In all cases, the water has leaked above the plaster ceiling and infiltrated the building and caused damage to the ceiling, walls or decorative crown moldings immediately below the scupper. *See photos 17-23 and 30-34.*
   b) Commissioner's Office: In the Commissioner's office, immediately below the center scupper location, the ceiling and the decorative crown molding has been damaged. Further investigation of this area revealed that the stick-built roof truss for the lower south west roof section exhibits extensive water damage. At the time of the condition assessment, there were no localized deflections of the roof above or ceiling below. *See photos 223-226, 219 and 230.*
   c) Water tests were conducted over the Commissioner's office. Although the leakage path was not recreated in this location, there are temporary measures in place by the facility managers to redirect water and we are confident that the leakage in this location is similar to the leakage path documented in other similar locations during the field work. The roof conditions above this area include a patchwork of components with multiple suspect transitions that leaked in other test areas including around the scupper opening, and that do also not lap over the top of the parapet wall. *See photos 144-153.*
   d) Conference Room: Water leakage is occurring at the northwest corner of the first story conference room. This leak is identified to be immediately below the location of the parapet wall at the scupper. The scupper is located in the corner on the horizontal field area of the roof immediately in front of the base flashing.
   e) Water testing above the conference room recreated the water leakage when applied to the metal panels above the EPDM flashing. Also when water was applied to the outside of the brick wall, near the scupper box, water immediate entered into the building. Therefore, the exterior connections on the outside of the brick wall are not water tight. Also the connections of the metal panels on the parapet wall and at the intersection of the masonry parapet wall to the edge of the metal panels are allowing water entry into the building. *See photos 182-187.*
   f) Core samples were conducted at the scupper above the conference room to confirm the construction of the scupper area. The sample revealed that the existing EDPM was installed over the original metal panel, but that a large custom made metal flashing was constructed and placed over the horizontal surface of the panels and over the vertical surface behind the EPDM flashings and above the metal panels. The integrity of the actual scupper flashing and box is not in question; however water is entering through the brickwork and through the metal panels, around the flashing and the box, traveling to the point where the piping for the scupper box enters through the wall, down into the wall by the scupper box and down into the building. *See photos 194-197.*
   g) Storage Closet: Another leak has occurred at the northeastern corner of the building in the ceiling of the storage closet. This leak is immediately below the location of the parapet wall at the scupper. Here the scupper is located in the corner on the horizontal field area of the roof immediately in front of the base flashing. *See photo 66 and 181*
   h) An extensive water test was conducted over this area as well. Just as with the northwest corner, the condition here did not leak when water was applied to the area of the EDPM roof or the EDPM base flashings. However immediately when water was applied to the outside of the brick wall, near the scupper box, water immediately entered into the building. Also when water was to the metal panels above the EPDM flashing water began to enter into the facility. Therefore the same condition occurred at this location, the exterior connections on the outside of the brick wall are not water tight, nor are the connections through the metal panels on the parapet wall and at the intersection of the masonry parapet wall. *See photo 175-181.*

4) Review Exterior Conditions

a) Mortar within the exterior brick masonry is cracked and dislodged in some locations. Some brick masonry units are cracked and damaged. These conditions allow more water to enter the wall system than it is generally designed to withstand. *See photos 129-135*
b) Many of the existing pre cast concrete window header lintels have vertical cracks through the lintel. The cracks extend through the entire thickness of the pre cast lintel but do not extend beyond the lintels to the exterior brick, *See photos 243-247*
c) There are cracks along concrete block wall which leads down the exterior basement steps. *See photo 132*
d) There are some surficial horizontal cracks in the masonry near the foundation at the stairwell and base of the columns in the connector building archway next to the northeast corner of the building. *See photo 135.*
e) All of the downspouts from the lower North and South sides of the building drain out into below grade clay or PVC pipes that drain out onto the property downslope from the building. *See photos 248-249.*

c. Interview with Project Team

1) During SSR's time on site, the Pre-Design Conference, and via telephone discussions, personnel from both STREAM and JLL reviewed the history of water leakage at the facility. Several evaluations and corresponding repairs have been performed by others in the past. While water leakage volume has been reduced by some previous repairs, water leakage continues to occur at each of the four building corners. Previous repairs have addressed a small number of systems or components at a time.

d. Photographs

1) Photographic documentation is attached to the end of this report.

2. FUNCTIONAL AND DEPARTMENTAL OBJECTIVES

a. General Scope Summary For Requested Consulting Services

1) **SBC Project No. 529/00-08-2012-19** and **Task Authorization # 19-029-N:**

2) "The consultant shall survey the existing building for potential re-roof, structural repairs, interior restoration, and building envelope repairs related to ongoing water infiltration. The consultant shall provide a program, scope, schedule, and probable cost to include all building and site work costs per all applicable codes and regulations."

b. Program Verification Objectives

1) Survey the existing roofing, structural, interior, and building envelope conditions related to ongoing water infiltration. Survey includes:
   a) Roof condition assessment including visual documentation of condition, review of test cuts, and evaluation of drainage capacity.
   b) Visual evaluation of roof truss structural integrity.
   c) Visual evaluation of interior conditions.
   d) Visual evaluation and water leakage testing of vertical wall system and components. Water leakage testing of roof and exterior wall components.
2) Provide a Programming Verification Report to define the recommended scope, budget, and schedule to address the ongoing water infiltration and restore the damaged systems. Report to be utilized for restoring the roof and wall components to a water tight condition and make appropriate interior and structural repairs.

3. ADVISEMENT/ RECOMMENDATIONS

a. Scope

1) SSR recommends a complete removal and replacement of all roof systems at the upper and lower building sections in order to confirm a continuous, water tight installation in all areas. The roof replacement includes the adjoining connector building, and stand-alone (former kitchen) buildings in order to correct all associated roof drainage issues.
   a) Remove all of the metal panels and EDPM flashings on the interior side of the parapet walls on the lower roof sections. Once removed, the underlying parapet brick masonry will be repaired as needed. The existing stone coping cap will be carefully removed and set aside. Install a new reinforced, liquid applied PMMA flashing over the interior vertical, and top surface of the brick parapet wall to serve as an extremely durable membrane which will be tied into the base of the roof system. The existing stone caps should be thoroughly cleaned and reinstalled. Any broken or damaged sections of the stone coping should be removed and replaced with like materials. Install new high quality silicone sealants around and between the stone-coping caps.
   b) At the upper roof level, remove all of the metal panels on the interior side and coping cap of the parapet walls. Once removed, and the existing brick veneer is restored, a reinforced, liquid applied PMMA flashing will be applied over the interior surface and top of the brick parapet wall.
   c) On the lower and upper roof levels, the existing standing seam and flat lock metal panels systems should be removed down to the asphaltic underlayment. A new high temperature resistant underlayment will be installed along with a high density gypsum cover board and a new metal standing seam, kynar finished roof system that will include all specialized flashing components. This new system will match the color and appearance of the newer installed metal roof panels on the surrounding buildings and will match the profile of the original roof using materials coordinated with the Tennessee Historical Commission. The new roof systems will also include tapered insulation to be installed along the base of the parapet wall to increase the slope and provide improved drainage conditions. The replacement roof system should be designed as a continuous system from the top of the area down towards the parapet wall with a 2 foot wide internal sloping section which is used to effectively control drainage water towards the new scupper.
   d) Remove the existing round scuppers drain boxes, flashings and custom collector heads. New rectangular scuppers will be installed through the masonry wall and appropriately flashed into newly installed galvanized aluminum, Kynar finished collector heads, which have been custom made to match the historical design and appearance of the original collector heads. The scuppers will need to be built with detailed flashing on the interior roof side of the parapet wall, with solid type metal shelves through the masonry wall and flashing on the exterior of the masonry wall. As part of the construction of the scupper, a custom made screen will need to be installed to the front of the scupper to prevent debris clogging the drainage system. In addition to the modification of the primary scuppers, overflow scuppers will need to be installed in designated locations to provide emergency drainage as required by the building code.
      1] Remove all round drainage piping leading from the upper roof sections and the downspouts of the semicircle gutters so that the drainage discharges directly onto the lower roof sections. Install scuppers in the lower roof sections will be designed to accommodate the drainage from the upper sections of the roof.
      2] Installation of new 6” round downspouts from the new scupper collector boxes and new collector heads that connect to the existing subgrade clay or PVC storm water pipe network to divert and discharge the runoff water downslope and away from the building.
   e) Remove the four copper chimney caps at the upper roof level chimneys and replace with a galvanized Kynar finished aluminum cap, designed to match the color and profile of the original caps.

f) The existing flat-lock metal panels over the semicircle (turret roof) bay areas, the connector archway, and the stand alone adjacent building will be removed and replaced with a new metal standing seam roof system that includes the appropriate underlayment, cover board, step flashing and new oversized guttering.

2) Perform structural repairs to the roof truss over the Commissioner's office. Repairs to be designed and construction administered by a structural engineer. Once the roof is removed, a small area of the plank decking above the Commissioner's office will need to be cut out from the roof level. Additional wooden beam and post supports will be added along with specified hardware to support and reinforce the affected truss and re-distribute the load to the bottom and top chord of the adjacent trusses. Once the truss repair has been made, the cut out area of the wood plank deck will be restored with similar materials.
3) Repair the existing exterior brick mortar joints and any cracks in the masonry block walls or other precast concrete. Repair by filling all voids, tuck pointing as needed, and removing and replacing any broken pediments. Repairs will be done using a mortar that matches the profile, color, and consistency of the original mortar and is aesthetic of the masonry and preserve the historical requirements for the windows.
4) Perform structural repairs to cracked pre cast concrete window lintels using a structural epoxy injection repair to stabilize and strengthen the window header lintels. The injected crack will then be sealed with an appropriate mortar or grout to match the look of the pre cast concrete.
5) Repair any rotted or deteriorated wooden trim, fascia or soffits and re-paint as necessary to match the existing trim work.
6) Install new blown cellulosic, low dust insulation in the lower attic and on the horizontal floor areas of the upper attic. In the sloped upper attic spaces, install batt fiberglass insulation. The new insulation will be added above the existing insulation to meet the requirements of the current energy code.

b. <u>Budget</u>

1) Please see the attached budget worksheet for a breakdown of the budget estimate for the scope defined above.
2) The budget estimate is based on the current cost for materials and averaging the anticipated labor cost. This estimate is based on current cost and does not include any adjustment for inflation. For the purpose of developing the estimate, the contractor's overhead and profit is estimated at 30%.
3) The programming phase budget estimate is approximately **$408,451.**
4) Notable subtotals within the attached budget estimate include:
   a) Remove and replace all of the existing roof systems at both of the lower roof sections, the upper roof section, the bay window roof sections, the connector building, the stand alone building, and all scupper and flashing repairs: $325,272
   b) Structural truss repairs at Commissioner's office: $3,500
   c) Repair interior plaster: $6,095
   d) Interior painting: $3,480
   e) Repair cracked window lintels: $21,540
   f) Tuck point brick masonry, assume 35%: $24,324
   g) Perform masonry repairs: $3,200
   h) Deteriorated wood fascia and soffit: $5,670
   i) Increase attic Insulation, lower roof sections: $4,560
   j) Increase attic insulation, upper roof section: $8,740
   k) Chimney repairs $1,570

c. Schedule

1) Construction Schedule / Duration: SSR developed the following anticipated schedule to complete the scope of work provided in this report. The schedule is broken out by task, by building section, with a day requirement listed. Much of the work to be completed can be overlapped with several items of work being performed on the same day, therefore the total duration of the project would be less than the total shown.

Schedule:	
Lower Sections Roof Replacement	21
Bay Window Replacement	6
Upper Roof Section Replacement	22
Connector Building	4
Stand Alone Building	4
Treatment of Parapet Walls, Lower	8
Treatment of Parapet Walls, Upper	8
Scupper Rework	18
New Gutters and Downspouts	5
Interior plaster walls and ceiling repairs	14
Interior Painting from plaster repairs	5
Tuck pointing (approx. 35% of exterior walls)	14
Masonry Repair/Replacement (approx. 10%)	10
Wood Replacement (Soffit/ Fascia / Trim)	3
Install attic insulation, lower sections	2
Install attic insulation, upper section	2
Repair Wood Trim at Porch at Fireplace Chimney	2
Replacement of brick lintels	10
Truss repair (structural work)	3
	161

a) With a coordinated effort the total project duration would be less than 120 working days.
b) The complex nature of this project will require extremely close coordination between all subcontractors and an additional amount of on-site supervision and planning.

d. Site Selection

1) N/A – Existing building

e. Relationship of project to other facilities

1) Project includes the Moss Building, connector canopy, and Stand Alone Building. Building is connected to but project does not include the canopy to the northeast.

f. Functional Aspects

1) Facility will remain occupied during construction. Interior finish repairs will require coordination with tenants.

g. Required Design Phases

1) All design phases are required. Each design phase, including the bid phase, will require more than average time to develop complex, project specific details of existing conditions in order to control the quality of work.

h. Permitting Fees

1) The successful contractor will be responsible to obtain the required permits and pay the appropriate fees. Permitting fees have not been included in the estimate for this project.

4. ACKNOWLEDGEMENT OF PROJECT REQUIREMENTS

a. State Fire Marshal

1) The office of the State Fire Marshal will need to review the project specifications and drawings to determine if the renovation work needs to be reviewed for fire safety compliance.

b. Storm Water

1) As part of the re-design of the guttering and downspout system for the facility, an adequate connection to the existing storm water drain pipes will be made in accordance with the appropriate storm water runoff guidelines and drainage calculations.

c. ADA

1) N/A – No changes

d. Life Safety and Egress

1) N/A – No changes

e. Environmental/ Hazardous Issues

1) N/A – No changes

f. Applicable Regulatory Authorities

1) State and local authorities. Communicate intentions with Tennessee Historic Commission

g. SDG, HPBR, and/or BIM Compliance

1) The current energy code requires an increase in the attic insulation.

h. Commissioning by Third Party

1) Not required

i. Historic Designation and Compliance

1) All efforts must be made to maintain the existing aesthetic appearance. New components should be very similar to existing components in material type, color, and texture.

j. Design and Construction Quality Management

1) In the design phase the Designer shall:
   a) Establish and maintain clear and open communication with the owner and facility managers throughout the full duration of the project.
   b) Thoroughly review and understand the existing project conditions and information within this Programming Verification Report.
   c) Select high quality materials and systems by established manufacturers.
   d) Design must endeavor to maintain the existing appearance of the facility by selecting materials and systems of similar appearance.
   e) Provide highly detailed plans and specifications. Documents will require unique, project specific details to address the existing conditions and should not rely on generic details.
2) During the construction phase the Designer shall:
   a) Assist the project team in evaluating the bids of qualified contractors.
   b) Perform a detailed submittal review of all products and shop drawings.

c) Perform frequent site visits during construction to verify the installation meets the intent of the design documents.
d) Perform a detailed final inspection.
e) Require proactive maintenance plans and comprehensive warranties.

k. Additional Services

1) N/A

l. Coordination with Owner Provided Items

1) N/A

m. Designer Issues / Comments

1) Replacement of cracked window lintels will likely require removal of windows, shoring of openings, replacement of windows, and corresponding repair of interior finishes. In our opinion, this repair likely exceeds $100,000. Based on our understanding of the objectives of this project, lintel replacement has not been included in the cost estimate.
2) Repair or replacement of the damaged wooden window shutters is not included in this report.
3) Excavation, removal, and replacement of any below grade storm water drainage pipes are not included.

SSR appreciates the opportunity to provide this Programming Verification Report. Please contact us with any questions.

Thank you,

Mike Spach, RRO
Building Enclosure Specialist, Roofing

Gregory J. Isaacs, PE
Building Enclosure Engineer

Attachments: Budget Estimate (Engineer's Opinion of Cost)
D1-D3 Roof Sketches
Photographs

Engineer's Opinion of Cost
Task Authorization: 19-029-N
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Smith Seckman Reid, Inc.

Lower Roof Section Replacements

Item	*Unit*	*Materials*	*Cost*	*Labor*	*Cost*
Demo existing roof systems	2368 SF	$ -	$ -	$ 3.50	$ 8,288.00
Demo piping from upper roof system	60 FT	$ -	$ -	$ 2.00	$ 120.00
Demo Existing Scuppers	6 EA	$ -	$ -	$ 100.00	$ 600.00
Dens Deck underlayment 1/2"	2400 SF	$ 1.75	$ 4,200.00	$ 0.15	$ 360.00
Ice & Water Shield, High Temp	20 SQS	$ 36.00	$ 720.00	$ 15.00	$ 300.00
Standing Seam Metal Roof	2600 SF	$ 12.00	$ 31,200.00	$ 6.00	$ 15,600.00
Masonry removal and repair, scupper	6 EA	$ 45.00	$ 270.00	$ 100.00	$ 600.00
Step Flashing	130 LF	$ 3.00	$ 390.00	$ 2.00	$ 260.00
New Scuppers	6 EA	$ 150.00	$ 900.00	$ 100.00	$ 600.00
Collector Heads	6 EA	$ 150.00	$ 900.00	$ 30.00	$ 180.00
New Overflow scuppers	6 EA	$ 150.00	$ 900.00	$ 300.00	$ 1,800.00
Remove and reset stone coping	206 LF	$ -	$ -	$ 4.00	$ 824.00
Treat / coat parapet walls	840 SF	$ 5.00	$ 4,200.00	$ 4.00	$ 3,360.00
			$ -		$ -
			$ 43,680.00		$ 32,892.00

Bay Window Roof Section Replacements

Item	*Unit*	*Materials*	*Cost*	*Labor*	*Cost*
Demo existing roof systems	350 SF	$ -	$ -	$ 3.50	$ 1,225.00
Dens Deck underlayment 1/2"	350 SF	$ 1.75	$ 612.50	$ 0.15	$ 52.50
Ice & Water Shield, HT	6 SQS	$ 49.00	$ 294.00	$ 15.00	$ 90.00
Standing Seam Metal Roof	475 SF	$ 12.00	$ 5,700.00	$ 6.00	$ 2,850.00
New Gutters	100 LF	$ 6.00	$ 600.00	$ 3.00	$ 300.00
New Downspouts	60 LF	$ 6.00	$ 360.00	$ 2.00	$ 120.00
			$ -		$ -
			$ 7,566.50		$ 4,637.50

Upper Roof Section Replacement

Item	*Unit*	*Materials*	*Cost*	*Labor*	*Cost*
Demo existing roof systems	4428 SF	$ -	$ -	$ 3.50	$ 15,498.00
Demo Existing Scuppers	2 EA	$ -	$ -	$ 100.00	$ 200.00
Demo Metal Parapet walls	130 LF	$ -	$ -	$ 6.00	$ 780.00
Dens Deck underlayment 1/2"	4430 SF	$ 1.75	$ 7,752.50	$ 0.15	$ 664.50
Ice & Water Shield, HT	50 SQS	$ 36.00	$ 1,800.00	$ 15.00	$ 750.00
Standing Seam Metal Roof	5756 SF	$ 12.00	$ 69,072.00	$ 6.00	$ 34,536.00
New Parapet Cap	150 LF	$ 9.00	$ 1,350.00	$ 6.00	$ 900.00
Masonry removal and repair, scupper	2 EA	$ 45.00	$ 90.00	$ 100.00	$ 200.00
Step Flashing	110 LF	$ 3.00	$ 330.00	$ 2.00	$ 220.00
Valley Trim Metal	150 LF	$ 8.00	$ 1,200.00	$ 4.00	$ 600.00
Ridge Trim	120 LF	$ 10.00	$ 1,200.00	$ 3.00	$ 360.00
New Scuppers	2 EA	$ 150.00	$ 300.00	$ 100.00	$ 200.00
Collector Heads	2 EA	$ 150.00	$ 300.00	$ 30.00	$ 60.00
New Overflow scuppers	2 EA	$ 150.00	$ 300.00	$ 300.00	$ 600.00
New Chimney Caps Alum (2' x 5')	4 EA	$ 375.00	$ 1,500.00	$ 200.00	$ 800.00
New Gutters	10 LF	$ 6.00	$ 60.00	$ 3.00	$ 30.00
New Downspouts	60 LF	$ 6.00	$ 360.00	$ 2.00	$ 120.00
Treat / coat parapet walls	1000 SF	$ 5.00	$ 5,000.00	$ 4.00	$ 4,000.00
			$ -		$ -
			$ 90,614.50		$ 60,518.50

Connector Building

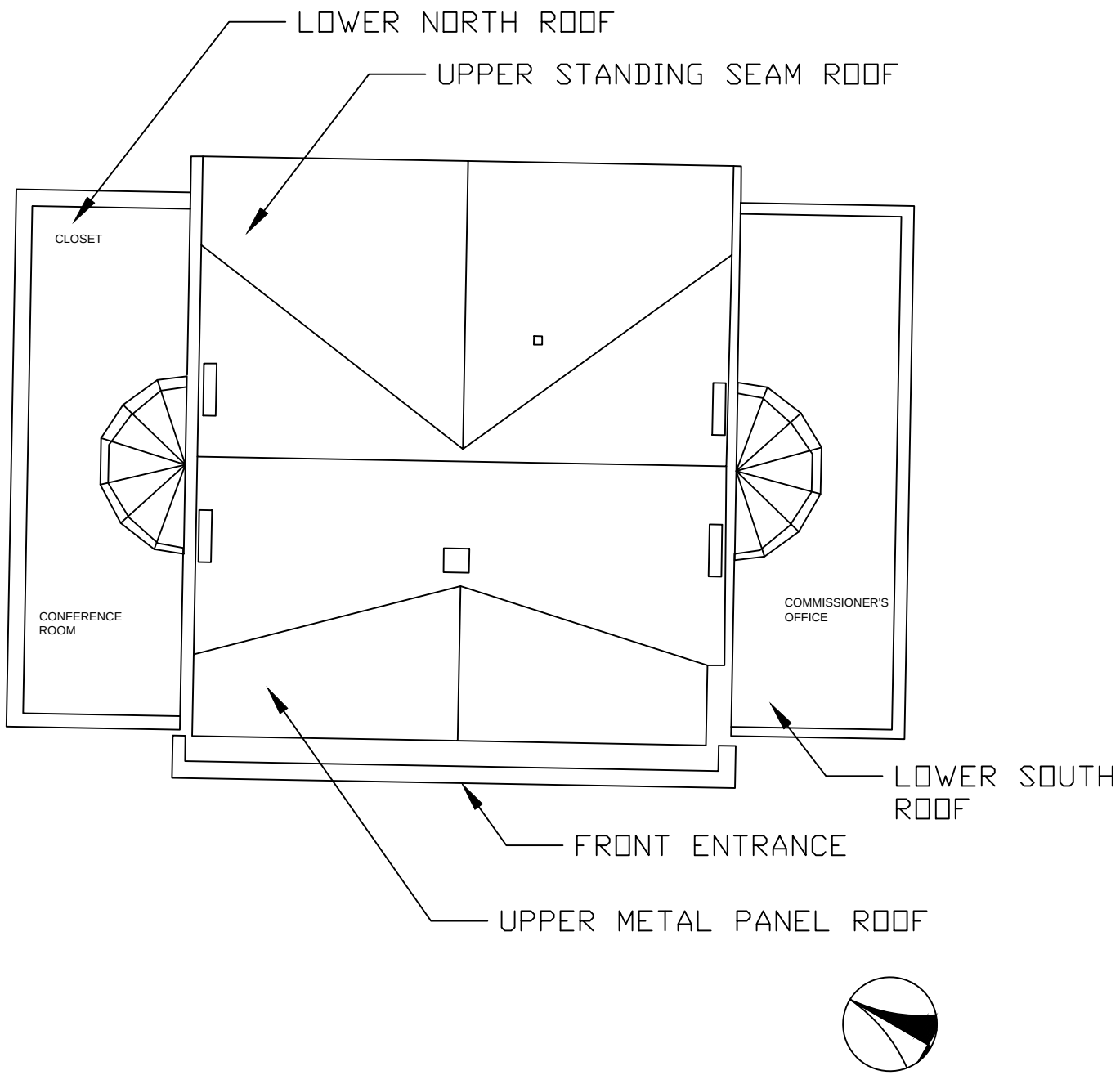
Item	*Unit*		*Materials*	*Cost*	*Labor*	*Cost*
Demo existing roof systems	600	SF	$ -	$ -	$ 3.50	$ 2,100.00
Dens Deck underlayment 1/2"	600	SF	$ 1.75	$ 1,050.00	$ 0.15	$ 90.00
Ice & Water Shield, HT	6	SQS	$ 36.00	$ 216.00	$ 15.00	$ 90.00
Standing Seam Metal Roof	650	SF	$ 12.00	$ 7,800.00	$ 6.00	$ 3,900.00
Step Flashing	20	LF	$ 3.00	$ 60.00	$ 2.00	$ 40.00
Valley Trim Metal	26	LF	$ 8.00	$ 208.00	$ 4.00	$ 104.00
Ridge Trim	33	LF	$ 10.00	$ 330.00	$ 3.00	$ 99.00
New Gutters	66	LF	$ 6.00	$ 396.00	$ 3.00	$ 198.00
New Downspouts	30	LF	$ 6.00	$ 180.00	$ 2.00	$ 60.00
				$ -		$ -
				$ 10,240.00		$ 6,681.00

Stand Alone Building

Item	*Unit*		*Materials*	*Cost*	*Labor*	*Cost*
Demo existing roof systems	710	SF	$ -	$ -	$ 3.50	$ 2,485.00
Dens Deck underlayment 1/2"	710	SF	$ 1.75	$ 1,242.50	$ 0.15	$ 106.50
Ice & Water Shield, HT	8	SQS	$ 36.00	$ 288.00	$ 15.00	$ 120.00
Standing Seam Metal Roof	750	SF	$ 12.00	$ 9,000.00	$ 6.00	$ 4,500.00
Valley Trim Metal	26	LF	$ 8.00	$ 208.00	$ 4.00	$ 104.00
Ridge Trim	27	LF	$ 10.00	$ 270.00	$ 3.00	$ 81.00
New Gutters	60	LF	$ 6.00	$ 360.00	$ 3.00	$ 180.00
New Downspouts	30	LF	$ 6.00	$ 180.00	$ 2.00	$ 60.00
				$ -		$ -
				$ 11,548.50		$ 7,636.50

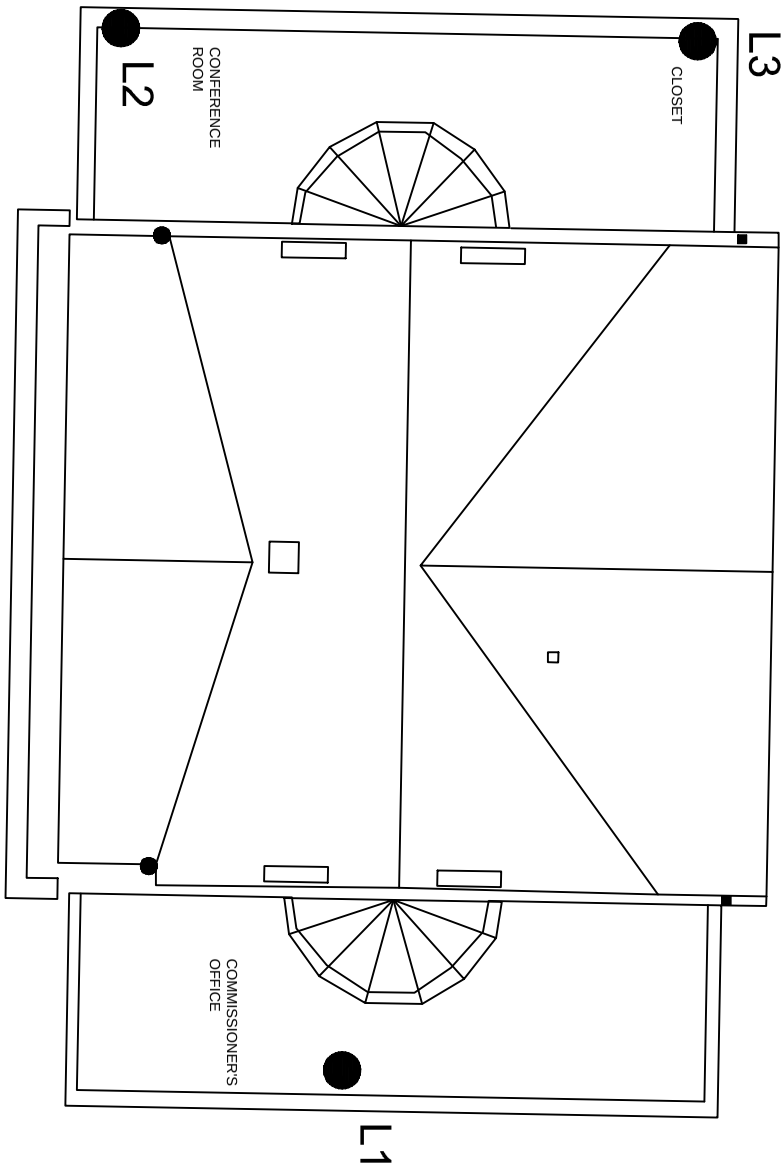
Totals		***Material Cost***		***Labor Cost***
Lower Roof Section Replacements		$ 43,680.00		$ 32,892.00
Bay Window Roof Section Replacements		$ 7,566.50		$ 4,637.50
Upper Roof Section Replacement		$ 90,614.50		$ 60,518.50
Connector Building		$ 10,240.00		$ 6,681.00
Stand Alone Building		$ 11,548.50		$ 7,636.50
		$ 163,649.50		$ 112,365.50
Add Sales Tax / Overhead on Labor	*9.50%*	$ 15,546.70	*30%*	$ 33,709.65
		$ 179,196.20		$ 146,075.15
Sub-total roof replacements				$ 325,271.35

Turn Key Components	*Cost*
Truss repair (structural work)	$ 3,500.00
Interior plaster walls and ceiling repairs	$ 6,095.00
Interior Painting from plaster repairs	$ 3,480.00
Repair of brick lintels (21 ea)	$ 21,540.00
Tuck pointing (approx 35%)	$ 24,324.00
Masonry Repairs (approx 10%)	$ 3,200.00
Wood Replacement (Soffit/ Fascia)	$ 5,670.00
Increase and add Attic Insulation, Lower	$ 4,560.00
Increase and add Attic Insulation, Upper	$ 8,740.00
Repair Wood Trim at Porch at Fireplace	$ 1,570.00
Structural PE Confirmation of Repair	$ 500.00
	$ 83,179.00
Total Roof Replacements	$ 325,271.35
Total with Turn Key Items	$ 83,179.00
Total Estimate of Cost	**$ 408,450.35**



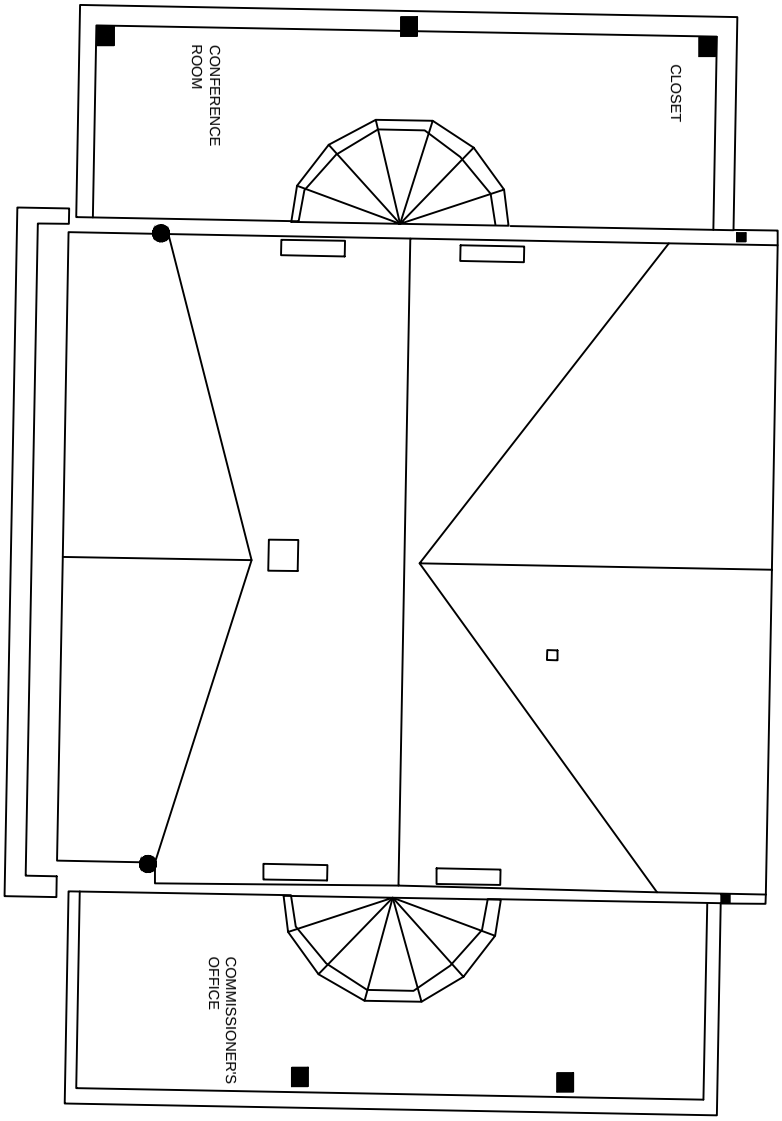
D1 ROOF PLAN

MOSS BUILDING, ELLINGTON ARG CAMPUS



D2 LEAK LOCATIONS

MOSS BUILDING, ELLINGTON ARG CAMPUS



D3

SCUPPER LAYOUT

MOSS BUILDING, ELLINGTON ARG CAMPUS


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Photo 4


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Photo 11


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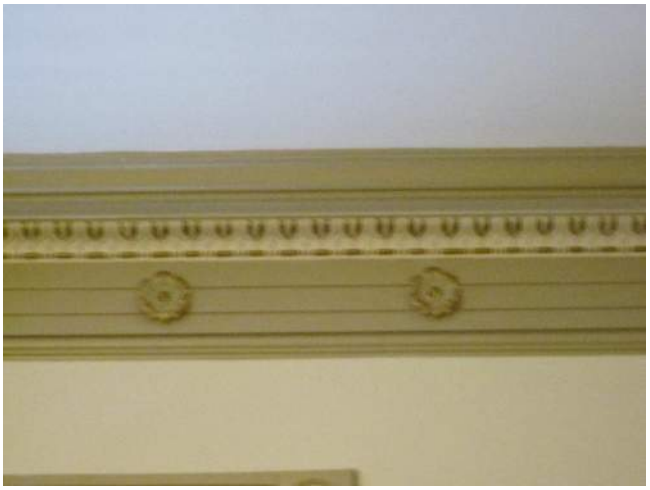
Photo 13


Photo 14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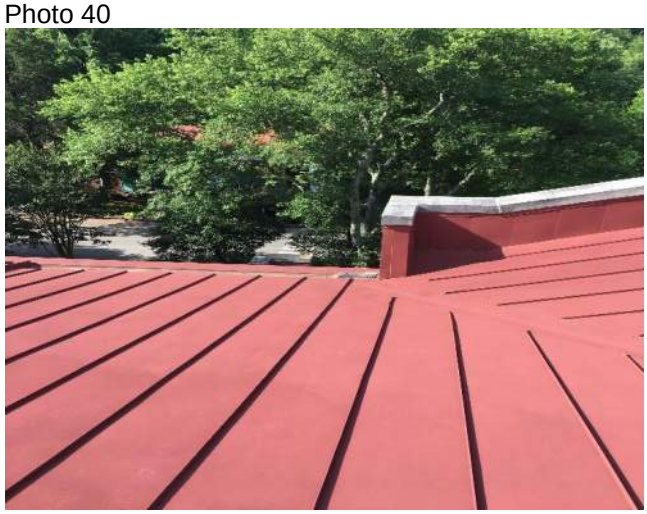
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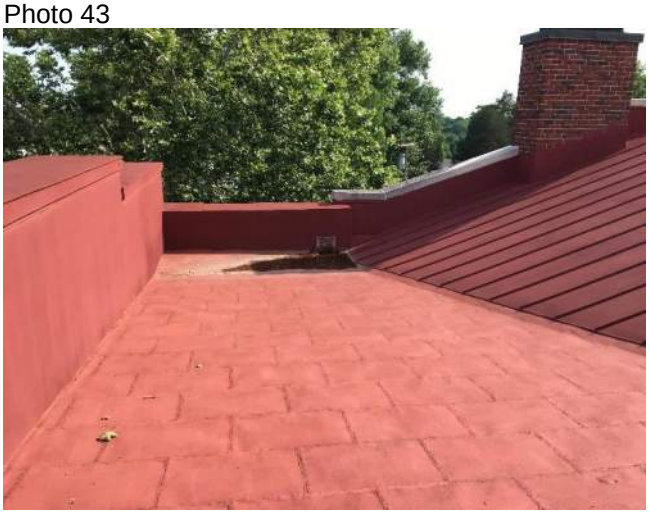
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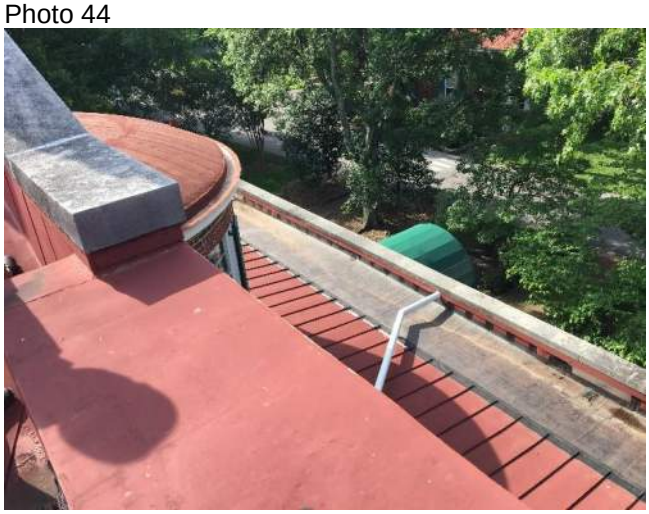
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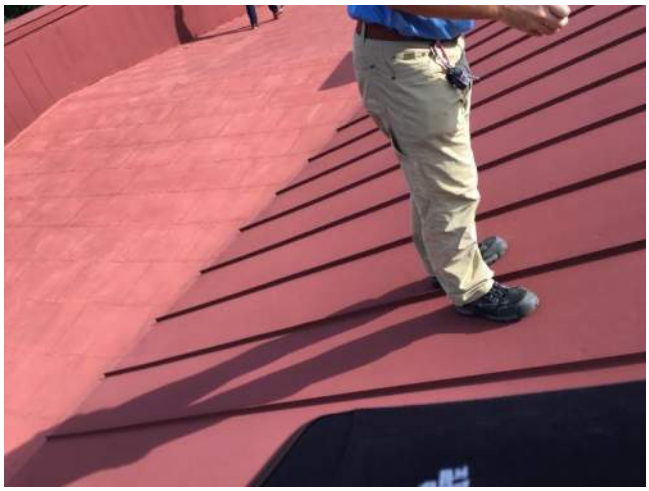
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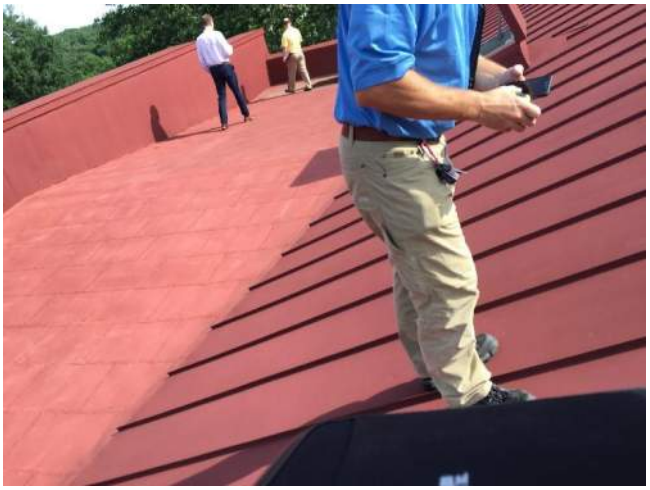
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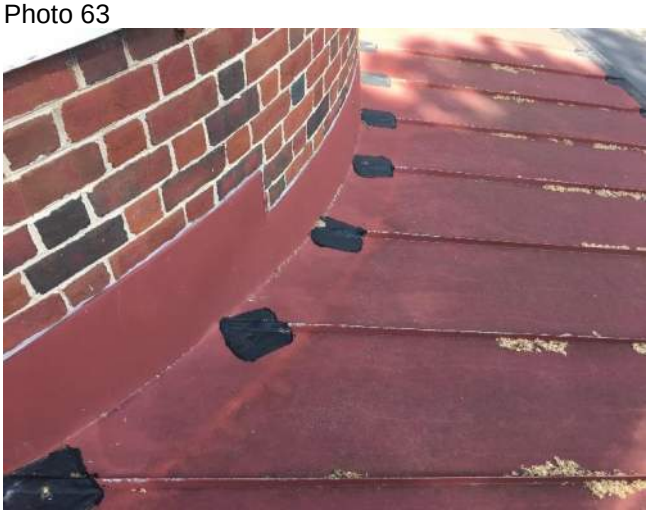
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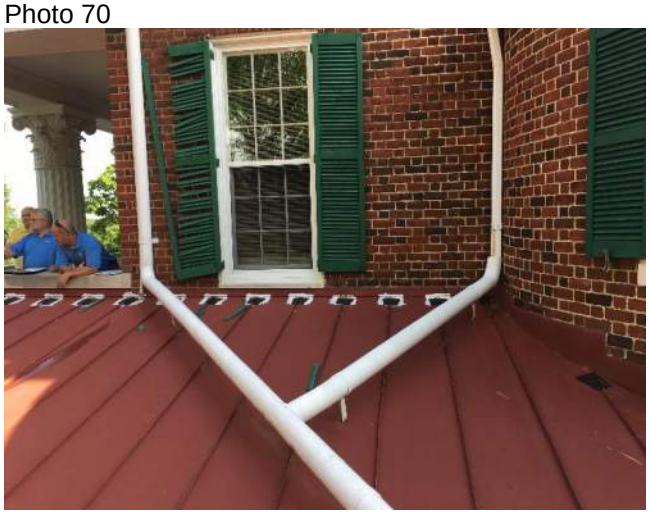
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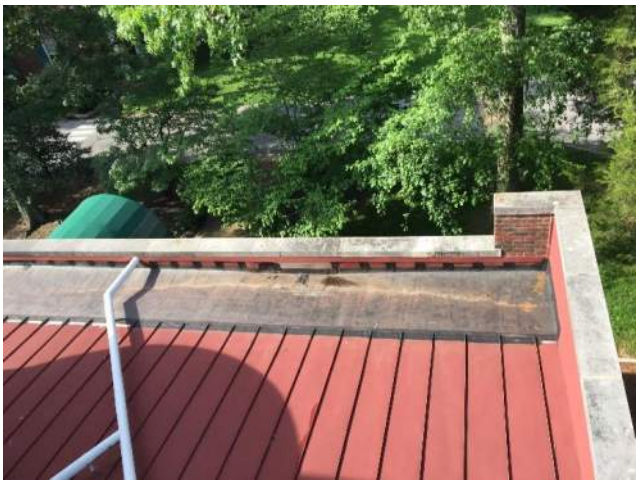
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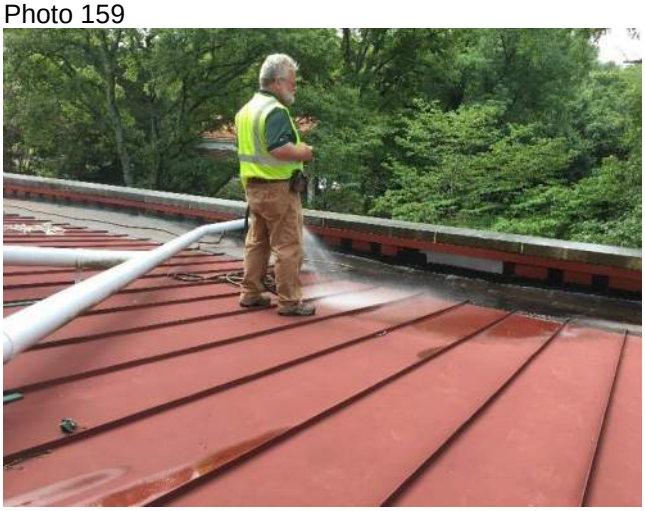
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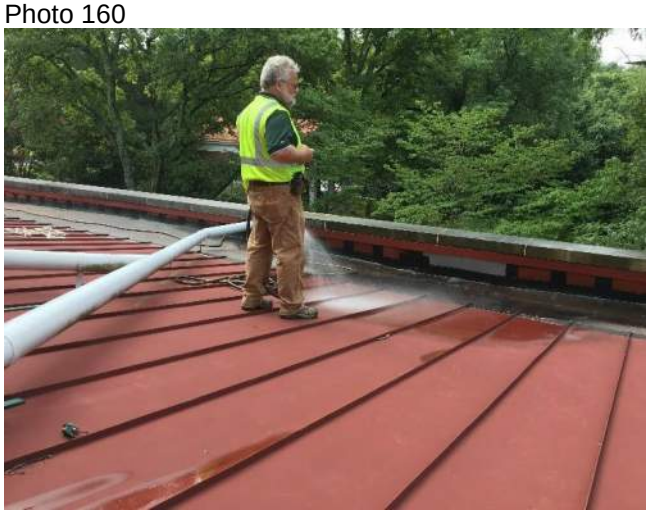
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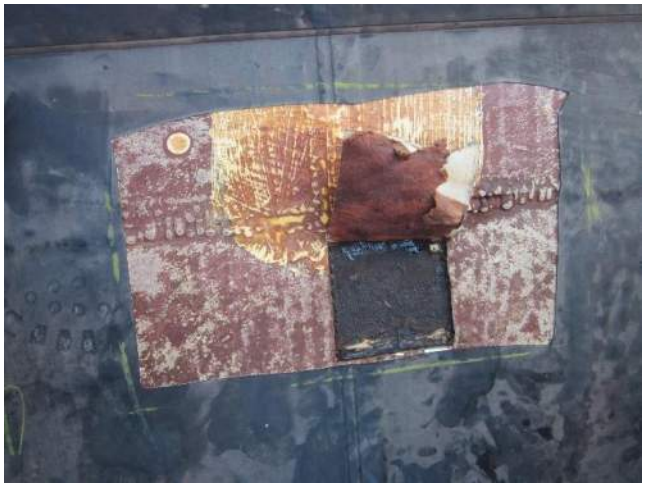
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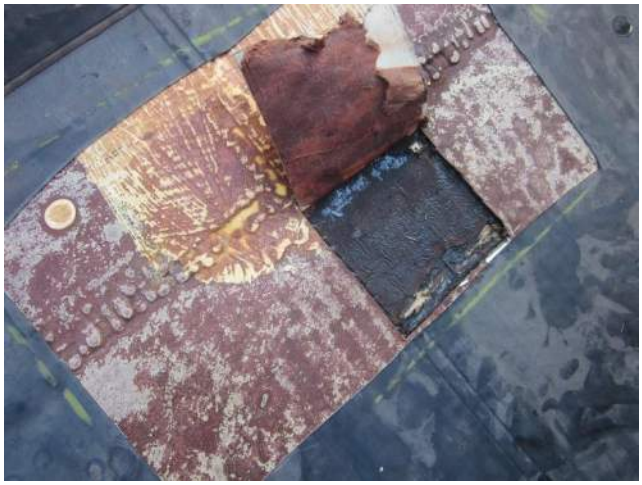
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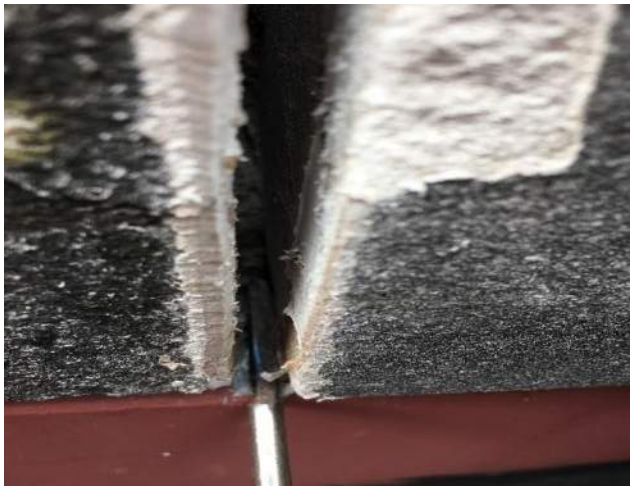

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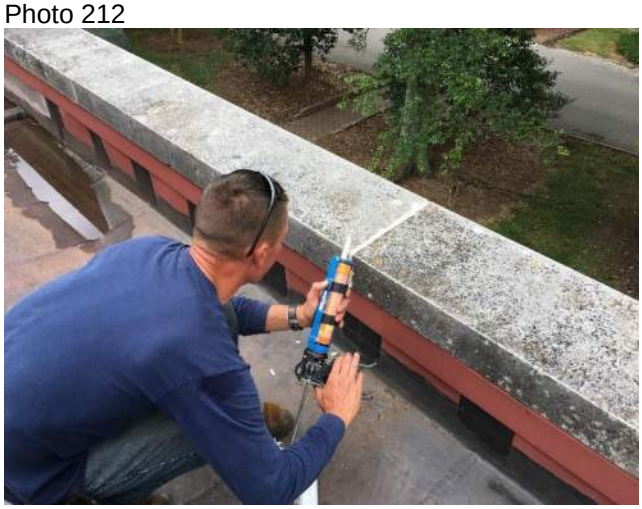

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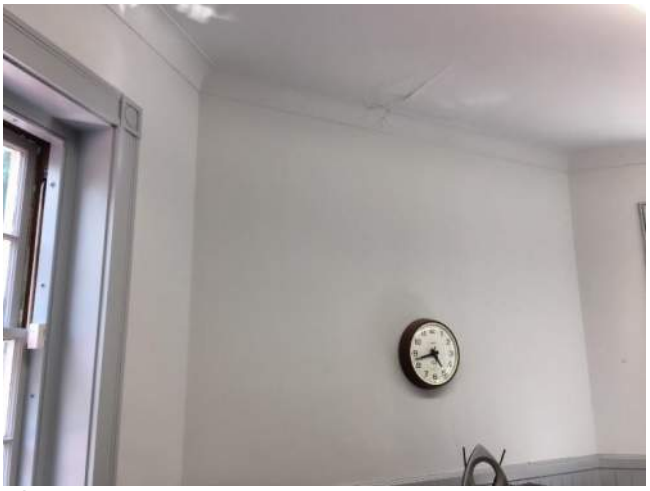
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